CLAIMS

1. An image data background determining apparatus characterized in that it is provided with:

an image data acquisition unit for acquiring image data expressing in multiple tones an image in picture elements in a dot matrix arrangement;

a frequency distribution charting unit for charting frequency distributions by totaling the picture elements of the image data acquired by the image data acquisition unit as classified by tone level; and

a background determination unit for computing a statistical quantity representing the characteristic of a reference area demarcated by dividing the frequency distributions according to a prescribed tone level and, if that statistical quantity is a sufficient value to indicate the presence of a background, determining that the image has an area constituting a background.

2. The image data background determining apparatus, as set forth in Claim 1, characterized in that:

said background determination unit computes the relative frequencies of said reference area and, if either each or the total of the computed relative frequencies is at or above a

prescribed threshold, determines that there is an area constituting a background in the image.

3. The image data background determining apparatus, as set forth in either Claim 1 or 2, characterized in that:

said background determination unit computes the relative frequency of each tone in said reference area and, if the total of the occurrences of tones having the prescribed or higher relative frequency is not less than a prescribed threshold, determines that there is a background area in the image.

4. The image data background determining apparatus, as set forth in Claim 1, characterized in that:

said background determination unit computes the standard deviation of the reference area, and determines the presence of an area constituting a background in the image if the standard deviation is not above a prescribed threshold.

5. The image data background determining apparatus, as set forth in any of Claims 2 through 4, characterized in that:

said background determination unit computes representative values of said reference area, and determines whether or not there is an area constituting a background in the

image by combining the representative values.

6.   The image data background determining apparatus, as set forth in any of Claims 1 through 5, characterized in that:

said background determination unit applies, in computing statistical values in said reference area, smoothing to the frequency distributions.

7.   The image data background determining apparatus, as set forth in any of Claims 1 through 6, characterized in that:

said background determination unit is provided with an image data retouching unit for so retouching the image data of picture elements, if the image has an area constituting a background, as to remove the background according to the area constituting the background.

8.   The image data background determining apparatus, as set forth in Claim 7, characterized in that:

said image data retouching unit, if the area constituting the background of the image is near a highlight, generates a correction curve having a parameter to maximize the tone of picture elements near the highlight, and corrects the tones of picture elements in the image data according to the correction curve.

9. The image data background determining apparatus, as set forth in Claim 8, characterized in that:

said background determination unit determines the presence or absence of an object in the image in accordance with a prescribed technique and, if there is found an object, said image data retouching unit alters the parameter of said correction curve.

10. The image data background determining apparatus, as set forth in any of Claims 1 through 9, characterized in that it is provided with:

an image data designating unit for designating the image data acquired by said image data acquisition unit to be either color image data or monochrome image data; and

a tone setting unit for setting a tone to demarcate said reference area in response to the designation by said image data designating unit.

11. The image data background determining apparatus, as set forth in Claim 10, characterized in that:

said image data designating unit designates the image data to be monochrome image data or color image data by the user's choice.

12. The image data background determining apparatus, as

-76-

set forth in either Claim 10 or 11, characterized in that:

said tone setting unit sets the tone to demarcate the reference area variably according to the state of the frequency distributions.

13. The image data background determining apparatus, as set forth in Claim 12, characterized in that:

said tone setting unit sets, where the designation by the image data designating unit is for color image data, said reference area narrower toward the high tone or, where it is for monochrome image data, said reference area wider than for color image data from the high tone to the low tone.

14. The image data background determining apparatus, as set forth in Claim 13, characterized in that:

said background area determination unit generates a retouching curve having as its parameter the tone designated by said tone designating unit, and retouches the picture elements of the image data acquired by said image data acquisition unit according to the retouching curve.

15. An image data background determining method for determining an area constituting a background in an image according to frequency distributions of image data, characterized

in that it is provided with:

an image data acquisition step to acquire image data expressing in multiple tones an image in picture elements in a dot matrix arrangement;

a frequency distribution charting step to chart frequency distributions by totaling the picture elements of the image data acquired at said image data acquisition unit as classified by tone level; and

a background determination step to compute a statistical quantity representing the characteristic of a reference area demarcated by dividing said frequency distributions according to a prescribed tone level and, if that statistical quantity is a sufficient value to indicate the presence of a background, determine that said image has an area constituting a background.

16. A medium recording thereon an image data background determination control program for determining an area constituting a background in an image according to frequency distributions of the image data, characterized in that it causes a computer to carry out:

an image data acquisition step to acquire image data expressing in multiple tones an image in picture elements in a dot matrix arrangement;

a frequency distribution charting step to chart frequency

distributions by totaling the picture elements of the image data

acquired at said image data acquisition unit as classified by

tone level; and

a background determination step to compute a statistical

quantity representing the characteristic of a reference area

demarcated by dividing said frequency distributions according

to a prescribed tone level and, if that statistical quantity is

a sufficient value to indicate the presence of a background,

determine that said image has an area constituting a background.